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2. October 2012

Online at <http://mpra.ub.uni-muenchen.de/41698/>

MPRA Paper No. 41698, posted 4. October 2012 10:40 UTC

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Many economists have questioned the high rate of profit within the financial sector as compared with the real productive sector. Over the last twenty years, the US financial sector's share of corporate profits has doubled, accounting for 44 percent of corporate profits in 2002 (Khatiwada 2010). The real wage gap between the financial and non-financial sectors has increased accordingly, while accumulation of physical capital in the productive sector declined.

## *Capital Overaccumulation*

Overaccumulation of financial capital at the expense of the real sector resulted in falling wages as well as in the most recent global financial crisis. This is a topic of increasing interest, as the idea that some developed economies have reached a stage of overfinancialization has gained some following. Although there is little written about financial capital overaccumulation, overaccumulation of physical capital has been written about extensively. This is embodied in the literature by Marx, Harrod/Domar, Keynes, Phelps, Baran and Sweezy, Samuelson/Diamond, Kaldor, Cass, and Minsky. These writings are summarized below:

- Marx: Physical capital accumulation occurs as capitalists attempt to mechanize processes and reduce labor costs at the expense of the working class. Capital overaccumulation is discussed with relation to labor: "The working population is little by little decimated as the result of the fall in wages, so that capital is again in excess relatively to them, or, as others explain it, falling wages and the corresponding increase in the exploitation of the labourer again accelerates accumulation, whilst, at the same time, the lower wages hold the increase of the working class in check."—Marx 1867, Capital Volume 1
- Harrod: Harrod finds that excess capital accumulation will have a depressing effect on the economy: "if  $G$  (actual growth) falls below  $G_w$  (warranted growth), there will be a redundancy of capital goods, and a depressing influence will be exerted; this will cause a further divergence and a still stronger depressing influence; and so on."—Harrod, 1939, An Essay in Dynamic Theory
- Kaldor: After a certain point of capital accumulation, capital ceases to contribute to productivity: "When capital is accumulated at a faster rate..., productivity will also increase at a faster rate, but the growth in the latter will lag behind the growth in the former, and beyond a certain point a further increase in the rate of accumulation ceases to be 'productive—it is incapable of stepping up the rate of growth of productivity any further.'" --Kaldor, 1961, The Theory of Capital

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<sup>1</sup> This is a later version of the same topic. The earlier version is somewhat different in terms of the model—after a great deal of additional thought, I decided that this model makes sense from a variety of perspectives and is superior to the earlier version.

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- Phelps (and others—Allais, Desrousseaux, Robinson, Swan, and von Weizsacker): Capital overaccumulation is inefficient: “Any growth path on which, at some point in time and forever after, the capital-output ratio always exceeds its GR (Golden Rule) level by at least some constant amount—equivalently, any path which eventually keeps the social net rate of return to investment (or competitive rate of interest) permanently below its GR value by at least some finite amount—is dynamically inefficient in the sense that there always exists another path which, starting from the same initial capital stock, produces more consumption at least some of the time and never less consumption.” —Phelps, 1965, Second Essay on the Golden Rule of Accumulation
- Baran and Sweezy: Excessive capital accumulation cannot be used: “...if a larger and larger share [of income] is devoted to investment, total income must grow at an accelerating rate. ...Quite apart from the fact that such an explosive growth process would sooner or later exceed the physical potentialities of any conceivable economy, there is simply no reason to assume that anything like it has ever occurred or is likely to occur in the real world.” Baran and Sweezy, 1966, Monopoly Capital
- Cass: To avoid capital overaccumulation, the government should take on an expansionary policy: “...the only way that a wealthy economy with a strong Protestant-type ethic can avoid overaccumulation is by conscious government policy.” —Cass 1971, On Capital Overaccumulation in the Aggregative, Neoclassical Model of Economic Growth
- Minsky: Capital overaccumulation can trigger a crisis: “the tendency to transform doing well into a speculative investment boom is the basic instability in a capitalist economy.” —Minsky, 1977, The Financial Instability Hypothesis

When the financial capital stock exceeds what is used for production, what is the rest of it used for? In Cass’ day, capital that was not used for production would remain “a bank account, returning at least the same as the productive sector, but never being drawn upon” (Cass 1971). It was clearly unproductive and inefficient. If the funds, today, are used to back further asset issuance, as part of the rehypothecation process for example, they are still not used for productive purposes.

Financial capital must be restrained and reoriented toward the productive sectors. Many individuals agree that the financial sector receives too much profit, unfairly high wages, and too much government backing. At what point is overaccumulation of financial capital pernicious?

#### *A Model of Financial Capital Overaccumulation*

We propose a model to calculate overaccumulation of financial capital below, but we note that there is a question about how far we go in constraining capital in general. Those who are opposed to capitalism for shrinking the profit rate and extracting maximum surplus value from workers argue that capitalism, not merely capital, must be constrained. But we do not believe this is a realistic position to take. If capital itself can be prevented from holding back productivity (e.g., investing in financial assets rather than in productive assets), real-sector economic growth can sustain itself.

The model we propose is based on the relationship between financial deepening (bank finance), speculative finance (shadow banking finance), and production. According to the model, for any level of economic development,

Domestic production ( $P$ ) is some multiple of financial deepening ( $D$ ), or

$$(1) \quad P = n * D,$$

where financial deepening represents the broad extent of liquidity in the economy (M3).  $D$  includes, but is not limited to, funds that are held as bank deposit liabilities that in part back bank loans held as assets. Bank loans can be used to finance the capital stock, so in a sense  $D$  contains information about (but is not excluded to) the capital stock<sup>3</sup>. Domestic production  $P$  can also be thought of as output  $Y$ , therefore  $1/n$  is some measure of the capital to output ratio, an indicator of productivity. According to overaccumulation literature of yore, there is a level of the capital to output ratio that is ideal, over which capital becomes less productive (low  $n$ ), and under which the economy is underdeveloped (high  $n$ ).

$n$  is a variable that is obtained from (1). We call it the “need for deepening” indicator. An economy with a low level of financial deepening, such as a command economy or developing economy with an infant banking industry will have a relatively high  $n$ . An economy with a very high level of financial deepening will have a relatively low  $n$ . A lower level of  $n$  is preferable to a higher value (although a low  $n$  is not necessarily the most efficient).

The shadow banking sector ( $F$ ) should be proportionate to financial deepening in a manner similar to the extent that deepening is proportionate to production. We can think of  $n$  as containing information about the productivity of the low-risk portion of the financial sector.

We propose that the stable equilibrium condition in the economy is:

$$(2) \quad n * F - D \leq 0.$$

This is a somewhat arbitrary starting place for setting up a relationship between deepening, speculative finance, and production. However, we feel that a starting point is necessary in conceptualizing the role of speculative finance in the economy. We refer to  $n * F - D$  as the “speculative spread.” This says that speculative finance divided through by productivity should be less than or equal to capital; that is, low-risk capital should be at a higher level, or at least even with, the portion of speculative capital which corresponds to the level of economic productivity. Otherwise speculation in and of itself trumps real finance.

Rearranging, we can also restate the equilibrium condition as

$$(2)' \quad D \geq \nu(F * P)$$

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<sup>3</sup> Clearly, financial deepening and capital stock are different but they are related. Looking at World Bank data from 1960 to 2010, and comparing gross capital formation and M3 (both as a percentage of GDP), we find that for 87 countries, the average ratio of M3 to gross capital formation is 1.54 with a standard deviation of 1.1.

This sets up a relationship between the higher-risk portion of the financial sector ( $F$ ) and the low-risk portion of the financial sector ( $D$ ). The higher-risk portion should clearly be lower than the low-risk portion. How much lower is a matter of debate. We assert that the two can be related through the same variable  $n$  that determines the relationship between production and low-risk finance, or through  $P$ . We assume somewhat loosely that financial deepening must be greater than speculative finance as it relates to production, where  $D$  is weighted toward the larger variable ( $F$  or  $P$ ) under the square root (as a property of square roots).

An unstable equilibrium exists at:

$$(3) \quad n * F - D > 0, \text{ where it follows that}$$

$$(3)' \quad D < \sqrt{F * P}$$

In the case of (3), the shadow banking sector is larger than a multiple of financial deepening. In other words, as in (3)', the square root of the product of speculative finance and production overshadows financial deepening. In this case,  $F$  must decrease.

To illustrate using real data, we find  $P$ ,  $D$ , and  $F$  for the period of 2001 to 2010, where

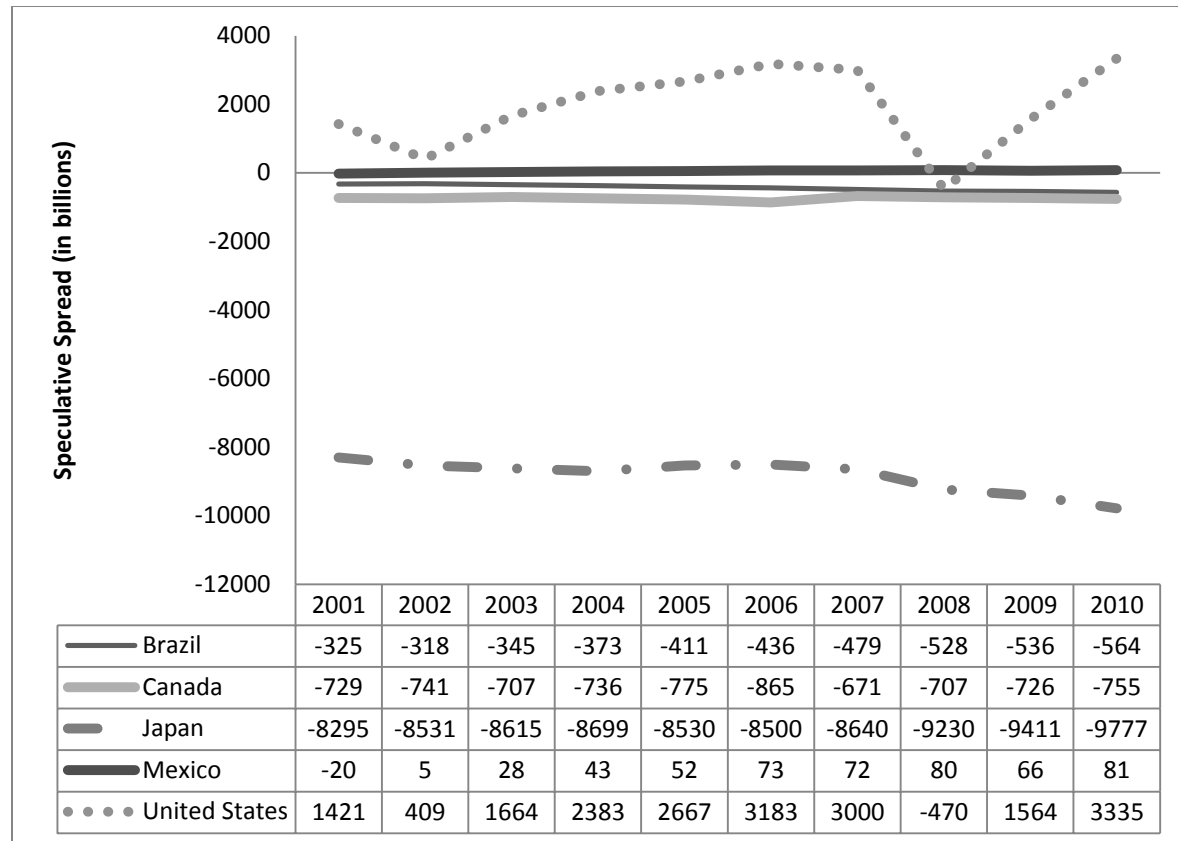
$P$  is measured as the sum of manufacturing value added, services value added and agriculture value added, in constant US dollars. We use World Bank data.

$D$  is measured by liquid liabilities (M3) in constant 2000 US dollars. We use World Bank and IMF data.

$F$  is the measure of non-bank financial firms' assets. We use IMF data and measure assets by adding liabilities and equity (deposits plus shares), since assets equal liabilities plus equity.

Data is not available for all countries. We look at the cases of Brazil, Canada, Japan, Mexico, and the United States for the period 2001 to 2010, which is the only period which contains all data.

**Figure 1. The “Speculative Spread”**



**Source: IMF IFS Database, World Bank Data, and Authors’ Calculations**

From the figure, one can conclude, the US is in a region of excess speculation, entering a “safe” region only during the crisis, in 2008. The US had engaged in financial speculation increasingly in assets in the shadow banking sector. Mexico is also in a region of excess speculation, but just barely. Over this period, investment in derivatives and pension funds came about and duly increased. Improvements in the auctioning process for government securities were implemented, as was the role of the primary dealer in secondary markets (Sidaoui 2006).

Japan is able to expand its financial activity and real production since it is deep into the “safe” region. This clearly demonstrates what some economists have pointed out—that Japan’s economy has remained in an economic slowdown since the “lost decade” of the nineties. Brazil and Canada are both performing well, with enough financial activity to grow yet remain in the “safe” region. These results are in line with common observations. For example, Canada did not engage in the creation and purchase of toxic assets before the recent crisis, and has been able to keep speculation in check. Brazil has a strong financial system which is dominated by both public and private banks.

### *Incorporation into Other Models*

We could also incorporate the idea of the “speculative spread” into existing models, replacing the capital-output ratio with deepening over production, as in the model above, with (2) and (3) acting as constraints or qualifications on the ratio. We incorporate the “speculative spread” constraint on the Harrod-Domar model, without implicating that this is an ideal model. We are merely demonstrating how the “speculative spread” constraint can be easily fit into existing growth models as a given constraint.

For example, if we use the Harrod-Domar model, we can say the following.

Given:  $P_t = nD_t$ ;

$I_t = S_t$ ;

$S_t = sP_t$ ;

$n \leq D/F$ ; (our constraint)

Where P is production (output that is produced), I is investment, D is deepening, and S is savings, F is speculative finance, and  $v = 1/n$  is the capital-output ratio.

The model functions as follows:

$$(1) \quad \Delta P = n\Delta D$$

over time:

$$(2) \quad dP_t/dt = n(dD_t/dt)$$

$$(3) \quad = nI_t = (ns)P_t$$

and

$$(4) \quad g = dP_t/dt = ns$$

$$(5) \quad g = ns = h + m$$

where g is growth, h is rate of labor force increase, and m is rate of labor productivity increase.

In the Harrod-Domar model, the economy’s growth rate depends on the level of saving, and also on the capital to output, read here as deepening to production, ratio.

Not only is there a “knife edge” equilibrium at  $g = ns = h + m$ , but we also add another constraint, where  $nF - D \leq 0$ , or  $n \leq D/F$ , such that  $g \leq (D*s)/F = h + m$ . The former part of the equation can be interpreted as the idea that stable growth must be less than or equal to the proportion of deepening that is saved, all as a proportion of speculative finance.

The constraint can be applied in much of the same way to most existing economic models.

### *Discussion and Conclusion*

The “speculative spread” concept is useful with regard to modern methods of finance. The model is just a starting point, a sketch. It is a constraint that can be attached to any growth model, and it is important in helping us to consider putting a limit on speculative finance. However, even in the face of the Great Recession, the political-economic climate makes it unlikely that the constraint will be taken seriously. This is unfortunate, since financial speculation paved the way for the crisis to spread. From our graph of the “speculative spread” it is clear that the United States has an issue with finance in excess of production. Whether we pursue economic models that emphasize this point is up to scholars of our age.

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